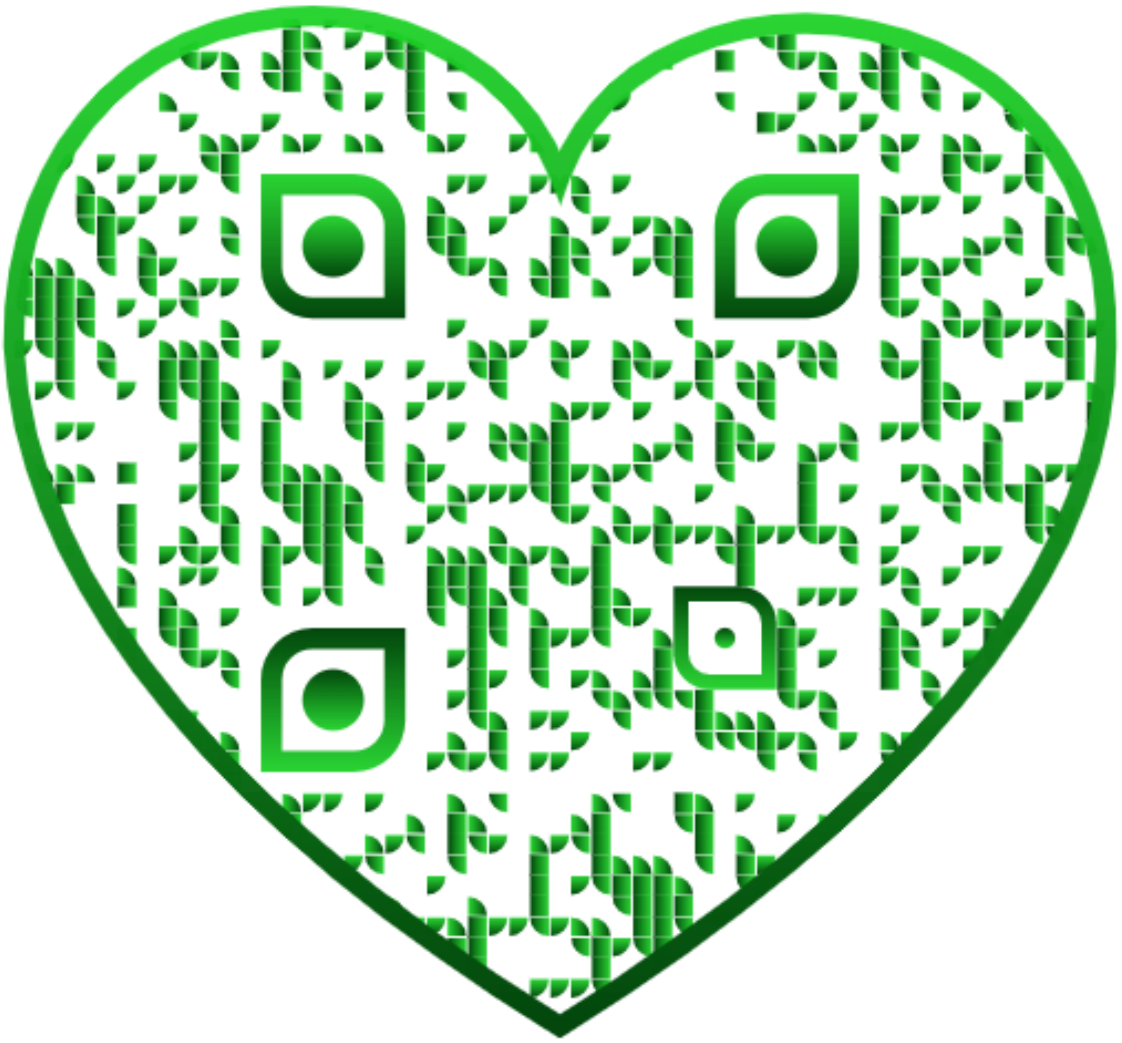
WORM FARMING

Creating Compost At Home With Vermiculture

JASON JOHNS



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Introduction

Compost is essential for any gardener and many people will make their own compost with kitchen scraps, lawn cuttings and other garden waste. Whilst this compost is good and your plants will appreciate it, you can make an even better compost using your kitchen scraps that your plants are going to love you for!

Worm farming, or vermiculture is the process of turning your kitchen scraps into a high quality compost that is very much sought after. Many championship winning gardeners will use worm castings (the result of worm farming) to feed their plants so that they win the competitions. Worm castings are jam packed full of nutrients and most particularly micro-nutrients that your plants really need to thrive and grow.

Anyone can create a worm farm at home; it can be as big or as small as you want it to be, depending on how much compost you want to produce and the space available to you. A worm farm does not need to be a huge commercial sized venture and can be done in a relatively small plastic tub.

This book will teach you everything you need to know about worm farming, from why it is so popular and beneficial to exactly how to create and manage your own worm farm. Once your worm farm is set up it does not need a huge amount of work to maintain it. It is something you can do yourself or you can do it with your children who will be fascinated by the process!

Worm farming does not require any expensive materials as you can use simple plastic containers, newspaper and then the food waste from your kitchen. The

most expensive part of a worm farm will be the worms but once you have established your worm farm you will have more than enough worms and can even turn it in to a commercial venture, as you will find out later in this book.

Anyone who is a keen gardener or who uses compost can benefit from worm farming. It is incredibly simple and produces a very high quality compost; just look online at the price of worm compost compared to traditional compost and you will notice a significant difference in price.

As you read this book you will learn everything you need to know about worm farming from choosing the right worms, setting up your worm farm, feeding your worms, harvesting your compost and caring for your worms so they produce high quality compost regularly.

This is one of the most enjoyable ways of producing compost and even if you already compost you can use vermiculture to create an extra special compost for when you want to give your plants that little something special. You will learn shortly just how beneficial worm castings are and how you can use them in your garden.

Enjoy learning all about vermiculture and how you can create your own worm farm at home. You will be surprised how easy it is and just how enjoyable worm farming is, plus the high quality compost will give your plants a much needed boost!

Vermiculture: What It Is and Why It Matters

Vermiculture or vermicomposting is the process of using a particular type of worm to take organic food waste from your kitchen and turn it into a high quality, nutrient rich compost that is beneficial for your plants. It is simple, convenient, silent and highly effective, turning your kitchen waste into a compost that is normally expensive to purchase. From an environmental point of view it saves energy, pollution from transporting your kitchen waste, filling up a landfill and it also helps to rebuild and fertilize your soil.

Because the worms turn organic waste into a nutrient rich compost it means that you do not need to spend money on fertilizers which are potentially harmful to the environment. It is a completely natural process and something that many more people should be participating in; it is nature's way of recycling!

The compost produced by a worm farm helps to improve the aeration, structure and texture of your soil as well as helping it to retain moisture better. This is going to help your plants to grow stronger, have much deeper root systems and be far more tolerant to droughts.

Worms have been turning organic waste into top soil for millions of years and they eat organic matter, decomposing it in to a natural, nutrient rich soil which is referred to as worm castings or vermicompost. It is an excellent source of food for your plants that naturally replaces the nutrients your plants take from the soil and are lost when the plants are harvested.

One other big advantage of worm farming is that the resulting compost is full of

beneficial microorganisms which your soil desperately need. These help to break down organic materials in your soil and make nutrients available to your plants.

Caring for your worms is simple, you just feed them organic waste from your kitchen. They will pretty much eat anything, though meat and dairy products should be avoided. Any vegetable or fruit scraps will be appreciated as well as leaves, grass clippings and so forth.

You may be forgiven for thinking that you can go out in the garden and dig up earthworms and use those in your worm farm which will do an okay job but they are not going to do the best job. The best are a type of worm called Eisenia Fetida or red worms which are found in the top foot and a half of the soil and are brilliant at breaking down waste matter. These can be bought from sites such as Amazon (click here for info) and will propagate in your worm farm. About every three months you will be able to harvest your worm castings to use as compost.

Worms are surprisingly easy to care for and once you have grasped the basics from this book you will find them indispensable and simple to look after.

Vermiculture has a lot of advantages and benefits both to you the gardener and from an environmental point of view. Worm compost is an ecologically sound product that is creating using organic materials helping you to reduce the amount of garbage you dispose of and the environment concerns surround that. You use readily available products in your worm farm and as your farm grows so you can sell on the worms and the castings to make a profit, all of which will be discussed in a later chapter.

As soon as your red wrigglers have started to produce castings you can start

removing them if you prefer, though many people will leave them for about three months until there is enough castings to actually be of use.

The castings produce a compost that is highly sought after and actually very expensive to buy because it is so beneficial for your soil. It is packed full of nutrients and helps your soil to retain moisture as well as repopulate the soil with beneficial micronutrients.

Vermiculture is something that any gardener can do, regardless of how experienced they are and it is a good way to get some top quality compost for very little money. Over time as your worm farm grows you will produce more and more compost; initially it takes a bit of time for them to get going but as the number of worms grows so they will produce more compost for you. My opinion is that worm farming is important for you as a gardener and will help you grow some superb plants!

What You Need To Setup a Worm Farm

Worm farming can be as costly or as cheap as you want it to be. With a bit of imagination and recycling you can use items you have around the house which will be more than enough to get yourself started. Probably the only expense will be the red worms but if you can get hold of some manure you can find red worms in well rotten manure which you can use in your worm farm.

These are some red worms similar to those you can find in compost or in manure. They are different from normal earthworms and they are very good at breaking down organic waste (i.e. kitchen scraps) and turning them in to a very useful compost.

You will need bedding and food for your worms, which will be discussed in upcoming chapters but these are newspapers and kitchen scraps. Neither of these are going to cost you any real money as there are plenty of free newspapers you can get your hands on.

The only thing you will need is something to keep your worms in. You can buy worm farming kits which include bins (see here for details) or you can make your own at home which isn't hard. All you need is a plastic box with a lid. It does need to be a good size but you can buy lidded plastic storage boxes from discount stores for a few bucks and they will do the job just fine.

Even an old refrigerator will make a good worm farm and these can be picked up for free. Simple lay it in its back, remove the trays and drawers and prop the

door open with a piece of wood so it is open about an inch. This allows for some air circulation which your worms will appreciate. If necessary, drill a hole or two in the back so that excess fluid can drain out. In hotter areas the fridge protects the worms from the heat and keeps them warm throughout the winter. In colder areas you are going to need to ensure your worms are warm meaning you may need to move them in to a shed or garage or otherwise insulate them.

A lot of worm bins are either black or dark green because worms do not like direct sunlight. If you buy a clear plastic bin then cover it (or paint it) on the outside to keep the light away. Remember that worms are underground creatures and they will not stray towards the edges of your worm farm to consume that food.

That is pretty much everything you need for your worm farm and as you can see it isn't going to cost you a huge amount of money. The lovely thing about worm farming is that it is a great way to cheaply produce a lot of compost whilst naturally recycling your kitchen waste. Every worm farmer I know is almost fanatical about it because it produces such amazing compost. For anyone who is serious about their fruit and vegetables, worm compost can be a secret ingredient that will give you the edge, particularly in competitions!

The Different Types of Worm

Whilst you may look at worms and think they are all the same, there are numerous different species of worms with different habits and food requirements. Whilst all the different worms used in worm farming are earthworms, there are subtle differences between them and it is important you choose the right worm.

All species of worm break down organic matter into compost with the difference being in how long it takes them to do this. Worms that live in the top eighteen inches of the soil are the best at breaking down organic matter, which is where the worm farmer's favorite, the red wiggler, resides. Many of the earthworms you find in your garden are going to be those that live deeper in the ground and spend more time aerating soil.

The red worms, often found in manure, live near the surface and will be found in animal dung, leaf mould and other decaying plant matter. They are called epigeic because they can give above the earth and also detritivorous because they eat plant detritus. I used to get bags of manure which I used on my allotment as fertilizer and after a couple of months when I emptied these bags out they would be full of red wigglers ready to go in my worm farm.

These particular worms are voracious eaters and will speed up the natural composting process by several months, chewing through organic materials and turning into a high quality humus.

The worms break down the organic matter with the bacteria that is around them as they do not have teen, jaws or really even a stomach. This bacterial process leaves waste bacteria in the worm castings which are actually very beneficial for

your soil and your plants.

The bacteria in the worm is great at breaking down organic matter and so the worm castings or vermicompost is very well processed and in a state which can easily be absorbed by your plants. Think of it as a superfood for plants as they can quickly absorb and use the nutrients which will help them grow. The bacteria in the worm's gut will neutralize any harmful pathogenic material, which means the worm castings are clean and will not carry any diseases which could infect your plants.

When you are setting up your worm farm you ideally want the red worms or red wigglers (Eisenia Foetida or Eisnia Fetida). They are also known as brandling worms and can be confused with tiger worms or Eisenia Andrei. In Europe a different worm is more common used, known as nightcrawlers or dendrobeana, which are particularly favoured for worm farming and fishing. The driftworm or Lumbricus Rubellus is commonly called the Red Wiggler in Europe. This is a very robust worm, commonly used as fishing bait (a great market for your excess worms) and popular in vermiculture outside of the USA.

There are a lot of different common names for the worms used in worm farming and many of them overlap, leading to confusion as to whether or not you are ending up with the right worm or not. We'll now look at the different types of worms and use the Latin names to ensure you can correctly distinguish them from each other.

Eisenia Andreia

This worm has alternate bands of light and dark red, which is where it gets its common name, the Tiger Worm, from. Often confused with Eisenia Fetida they are also referred to as Red Worms by some people. They are very good in vermiculture and are quick breeders. Growing to between two and three inches

long and weighing around 900 to 1000 worms per pound they are excellent fishing worms. Being found all over the world there is no risk to the environment if any happen to escape. They thrive in a temperature range from 33F to 88F though the optimum range is just 70F to 80F.

Eisenia Fetida (Foetida)

These are the most commonly found worms in vermiculture and are very easy to get hold of. They are normally referred to as Brandling Worms, Manure Worms, Compost Worms, Red Worms or Red Wigglers. They make a good fishing worm as they are active on the hook and stay alive for some time in the water, hence the name the red wiggler. They are typically between two and three inches long and in a pound you will get between 900 and 1000 worms. They breed rapidly and are great at breaking down waste into compost. Red Wigglers are also commonly found around the world and pose no environmental threat if they escape. They can live in a temperature range of 38F to 88F though the optimal range is 70F to 80F.

Eisenia Hortensis

This is known as the European NIghtcrawler or Redworms and are bigger than the previous worm. They breed rapidly and produce a lot of castings and are very popular as fishing bait seeing as they can survive in water close to freezing temperatures and are suitable for salt water fishing. The worms will grow as long as seven inches, though are more typically between three and four inches long. In a pound you are likely to get between 300 and 400 worms.

Eudrilus Eugeniae

This is the African Nightcrawler and are bigger than the Red Wigglers, growing up to and over six inches long! They are great worms for composting and are good for fishing due to their size, firm skin and activity on the hook. They can tolerate temperatures from 45F to 90F though prefer the temperature to be

between 75F and 85F. These worms do not like extreme cold and do not like being handled or their environment being disturbed, meaning they are not ideal for vermiculture, but great to sell as fishing bait! In a pound you will see between 175 and 200 worms.

Lumbricus Rubellus

This is another European worm commonly called the Driftworm or the Red Wiggler. It is not a true compost worm, being a burrowing worm, but it is Endogeic, feeding close to the surface. It grows to about four inches long and is often used in vermiculture as it is active and productive at low temperatures. The best temperature for this worm is around 50F though when the temperature goes down to 40F it will stop breeding. Being a lively and robust worm it is popular as a bait worm, particularly as it is suitable for salt water fishing. However, in America this is considered an exotic animal and could well become an invasive species as it has already escaped and is spreading in the wild where it is damaging the native forests. If you are in North America you will need to check whether you can buy and use these.

Lumbricus Terrestris

Another common species of earthworm often called a nightcrawler. These are a deep burrowing species, or Anecic, and so are not suitable for worm composting. They can burrow down to six feet under the surface and are great for the gardener as they aerate the soil and help with water retention.

Perionyx Excavatus

This is known as the Indian Blue Worm as it has a very distinctive iridescent blue sheen on its skin. This is a tropical worm and does not like cold weather, handling or its environment being disturbed. It is small but is a prolific breeder that matures rapidly, making it great for vermiculture. It is known as a bit of an escape artist and has escaped from worm farms, which being a foreign species

does not make it very popular.

Using a Variety of Worms

You can use a single variety of worm in your worm farm, though some people claim that using two or even three different varieties of worm helps increase yields as the different species have different temperature requirements and so you get more consistent activity without having to manage the temperature.

Most people will use Eisena Fetida together with Eisena Andrei and sometimes Lumbricus Rubellus. This cocktail of worms seems to be very effective and forgiving of environmental variations. The worms do not fight and there does not appear to be any issues with hybridization.

However, if you are in North America you may not be able to use the Lumbricus Rubellus worm as it is an invasive alien species. If you don't use this worm then it doesn't really matter. You can build your worm farm with just a single species of worm and it will function perfectly well and produce great worm compost.

Buying Your Worms

You can buy your worms online, from a local supplier or if you know something who is already practising vermiculture you may well be able to get worms from them. You will need a half to one pound of worms, depending on how big your worm farm is, but they will reproduce rapidly and your worm population will soon grow and increase.

When you end up with too many worms you can either sell some for bait, release them in to the wild or create another worm farm. They don't need to go to waste.

So long as you get any of the worms we have discussed in this chapter you will

be able to get worm composting. The Red Wigglers are considered to be amongst the best and are worth obtaining if you can, though other ones will be perfectly okay for you.

A Simple Worm Farm Plan

There are many different types of worm farm you can build and it can be as complex as you want it to be. For most of us though we want something that looks good, takes up as little space as possible and is convenient both to use and clean. The home vermiculturalist has a lot of options available to them from pre-made systems to building their own, which is easier than you may think!

Stacked bin composters are one option as when the worms migrate upwards towards the food they leave the casting behind at the bottom. With a number of different stacked bins, with a path upward for the worms, they can fill one bin then migrate upwards to another. When a bin towards the bottom is full you can harvest the castings and then put it at the top to reuse it.

How many bins you use and how big there will depend on your available space as well as how much compost you want to produce. Some of the best containers are the household plastic storage bins found in supermarkets, hardware stores and so on. Usually the sides are tapered so they can be stacked which allows for you to nest the bins. For the top bin you will need a lid and you need opaque bins as worms do not like the light. Black or dark green containers are by far the best for keeping the light out.

For most home composters you will need just three containers of a ten gallon or 45 litre size. If you are going to process more than just kitchen waste then you can set up bigger bins with more tiers.

The Sump Bin

The bottom bin is going to be slightly different to the other bins because this one will catch the worm tea or the fluid coming out of the bottom of your worm

bins. Ideally you want a barrel tap on this bottom bin to make it easier for you to get the tea out. Just drill a small hole in the base and use a 15mm / 3/8" barrel tap. This isn't essential but it is going to make it a lot easier for you to get the compost tea out without making a mess or disturbing the worms. Just ensure that the tap seals well in the hole to prevent leakage.

The Worm Bins

Above this sump bin you will need two other bins which are going to hold the worms. Both of these are prepared in the same way. Across the bottom of each container you need to drill some 6mm / ¼" holes to provide ventilation, drainage and allow the worms to migrate upwards. Separate these by about 50mm / 2" so the bins remain strong and there is plenty of room for the worms to move through the holes.

Also drill another row of holes the same size and the same distance apart about 4" / 100mm below the top of the bin to provide some additional aeration for the bins. You do not need to drill any holes in the lid which will be tightly closed on the top bin to keep the light out.

Assembling Your Worm Farm

The bottom sump bin is raised up on bricks so that you can get the compost tea out of the tap at the bottom easily enough. Try to find a shady location for it though if you are subject to long winters or frequent frosts you may want to move your worm farm into a garage or shed.

The first worm bin is placed in the sump bin and the third bin is placed on top of this so that there is a gap between the bins for the worm to live and work. It can help to use some spacers to separate the bins. You want a gap of about 4" between the sump and the first worm bin and about 6" to 8" between the worm bins. Anything like wooden blocks, sealed food jars and so on will do as

spacers. This will prevent the bins from jamming together and give the worms plenty of room.

There is likely to be a small gap between the bins which bugs can get in so this needs sealing with some cheesecloth, mosquito netting or something similar.

Starting Production

Now your worm farm is built, which won't have taken long, you can start to add the worms. Put just one worm bin in to the sump and fill it with the worm bedding and some compost. Then add the worms and leave them for three to four days before starting to add food. Cover with a tight fighting lid and cover the kitchen scraps with some more bedding to help the worms get to it.

Do not allow the worm farm to dry out, but don't get it get too wet either. Sprinkling water over the bedding every few days will keep it damp if the kitchen scraps do not.

After a while the worms will start to multiply and the castings will be increasing in quantity. Now you can add the second bin above the first. Put clean bedding in this bin as well as a small handful of castings from the first bin. Start adding kitchen scraps to this bin immediately and the worms will naturally dig upwards towards the new food, just ensure that the bottom of the second bin is resting on the worm bedding in the first bin to allow this to happen.

About three weeks after you have added the new bin the bottom bin should be free of worms and you can empty it. There may be a couple of stragglers left in the bin but don't worry, they can be dug in to the ground wherever you are using the compost and be perfectly happy.

Then all you do is keep rotating the bins when they are full of worm castings and

you have your own productive worm farm! You can increase your yield of worm castings either by adding more layers or building a second worm farm.

Every few weeks you will need to drain off the compost tea. Don't discard this as it is a highly nutritious liquid fertilizer that your plants will love. However, because it is so strong it will need diluting before it can be used.

This is a very simple way for you to build a worm farm. Of course you can make it as advanced or as simple as you want it to be depending on the resources available to you. If you do not want to stack the bins you can make the worm farm with just a single worm bin, and you'll learn more about harvesting the castings in this configuration later in the book.

The Single Bin Worm Farm

It is possible to make a worm farm out of a single bin, which is a common way people start out. However, the downside of this is harvesting is a little bit more messy and you lose more worms as you have to tip the contents of the bin out. If you have a large enough bin you can encourage the worms to one side.

The single bin worm farm is built in the same way as the stackable bin farm above except you have a single bin. You will need air holes, you still need a way of draining off the leachate and you need to look after your worms in the same way. With a single bin it is often put up on bricks with a tray underneath to catch the leachate that drips out of holes drilled in the bottom, rather than a tap.

Using Other Materials

Plastic bins are the quickest way for you to build a worm farm with the least amount of work on your part. However, you can make a worm farm out of wood by building a big box, though ensure you treat the wood with something to stop

it from rotting, which it will over time. Whatever you treat it with also needs to not leak out of the wood and into the compost otherwise you could harm your worms and produce poor quality compost. Do not use treated wood as many of the treatments used to make wood last longer will leach out into the soil and could harm your worms.

Feeding Your Worms for Excellent Compost

In order to make sure your worms thrive you need to feed them the right kind of food. Giving your worms a healthy, balanced diet will ensure they are healthy, live a long life and produce plenty of compost for you.

Feeding your worms too much citrus, dairy or onion isn't good for them and will not be so good for your soil either as it can make the resulting worm compost too acidic. Giving your worms too much meat is not recommended as they struggle to digest it but most importantly it can attract pests such as rodents to your worm bin which you want to avoid.

These foods are not so popular with worms and they will be slower digesting them, if they even digest them at all. Unfortunately, this means that these scraps are going to rot in your bin which will mean it starts to smell and will need changing soon. Basically the worms, like humans, will eat the food they prefer first before going to any other types of foods.

The smaller and softer the kitchen scraps then the easier it is for the worms to process them and turn them into valuable worm compost. It will help your worms if you shred the scraps before feeding them to your worms, though some people will freeze the scraps overnight which breaks down the cellular structure making it easier to digest.

Worms will like pretty much any fruit or vegetable scraps, cooked food, coffee grounds, tea leaves, crushed eggshells, weeds, small amounts of lawn clippings and so on. Heavily processed foods with lots of artificial ingredients aren't the

best for your worms but they will do a valiant job of digesting them for you. If you are adding any garden waste then you need to ensure it hasn't been treated with any weed killer or other sprays as these can kill your worms.

Anything in the onion family such as leeks, garlic, peppers, chillies and onions should be avoided or added in small quantities. For example, the onions in a meal could be used as could peelings but you wouldn't put whole onions in there. Spicy food would likewise be avoided.

Bread, pasta, processed wheat products, meat and dairy should be avoided or added in very small quantities. Fats and oils should be avoided as these cannot be digested by the worms.

For bedding you can use shredded newspaper, cardboard or sawdust but should avoid any shiny or colored paper as this could be toxic to your worms.

Lawn clippings will be enjoyed by your worms but you should avoid adding too much at once because it will clump together and rot which you want to avoid. Animal manure can be used though not cat or dog waste as it carries toxins harmful to humans. This again should be added in small amounts and the animals should not have been treated with worming medicine as it will be in the manure and effect your worms.

Each day you want to add about an inch or 2½cm of kitchen scraps to feed your worms. The uneaten food should be no deeper than about 2 inches or 5cm as it will start rotting. You should only add more food as your worms consume what is in the bin and you need to be careful not to overfill your bin with food. Composting worms prefer to eat the waste as it starts to decompose though if the food becomes smelly and slimy then they won't eat it. Too much food in the bin means the food will rot before the worms can eat it. The rotting food will

unfortunately harm the worms so you need to be careful not to overfill your worm bin.

When food rots it is typically an anaerobic reaction, meaning there is little or no oxygen involved. The worms need oxygen to survive so rotting food prevents the worms from breathing and can kill them.

Your worms are going to eat about their own body weight in food every day so if you've got three pounds of worms then they will need the same weight in food, roughly. Every time you check the bin you need to make sure that the uneaten food isn't building up. You can encourage your worms by chopping up larger pieces of food into smaller pieces, which makes it easier for the worms to digest it.

Start by feeding your worms a small amount of food, watching to see how much is being eaten then add more until you get the right amount of food for your worms. Over time your worms will breed and increase their numbers, meaning they need more food. It can take up to six months for you to build a full population of worms.

You worms are not like a garbage collector and they are not going magically eat all the food you throw in there. The chances are you are going to produce more kitchen scraps than your worms can eat so avoid the temptation to overfeed them.

When you check your worms you should check the amount of uneaten food in there. Dig through and you should see worm castings between two and four inches below the top layer and you will see worms of different sizes which will tell you they are breeding. If you see a lot of uneaten food then stop feeding the worms for a couple of days to allow them to catch up.

When you get to about 8” below the surface of the worm bin it should be nothing but worm castings which will look like a really good quality compost and have little, if any, smell. The surface of the castings should also have some worm eggs in. If there is rotting food between the top of the castings and the food then the baby worms will not be able to move up to the food when they hatch and so will die.

If there is any rotting food in your bin then you can fork in a little bit of fibrous material into it or remove the rotten food. If there is too much rotten food then you need to clean the bin and restart it as otherwise the rotten food will just not go away; it can take months to break down.

Getting the food right for your worms is very important because this is what they turn into the compost you are farming for. Make sure you do not overfeed them, but likewise make sure you give them enough food. Regular monitoring of your worm farm will tell you whether or not there is too much food in there or not enough and you can adjust the quantities you are feeding them. So long as you feed them well with the right food your worm population will thrive and thank you with a plentiful supply of worm castings.

Where to Locate Your Worm Bin

Ideally you want your worm bin to be light enough that you can move it if you want to, though not all worm bins are going to be transportable. Your worms will thrive in a sheltered area where they are not going to get too hot or too cold. They need a temperature of between 60-85F or 15-25C ideally. In the summer the temperature can climb, particularly as you will have used dark bins which is why they need to be in a shady spot out of direct sunlight.

The worm farm does not have to be in the garden and can be located in a garage, shed, basement or even a balcony. You can move it around as necessary though if the temperature is going to drop below freezing then you don't want to leave it outside for very long.

Most worms are not going to like being disturbed and will hide for a few days after the worm farm has been moved. This means they will reduce if not stop production of castings and you need to reduce the amount you are feeding them accordingly.

Worm bins can be very heavy, particularly if there is a lot of castings in them so you need to be very careful about moving them as you can end up hurting yourself. Take care and be careful moving it, watching out for any obstacles as if you drop it the worms will escape and you will lose many in to the ground, not to mention the loss of the castings too.

In most cases though you are not going to be moving your worm bin very much, if at all. If this is the case then you can build your worm bin in the place where it will be located and save yourself the work of moving it later on.

Give some careful thought as to where you are going to locate your bin as you can save yourself some work later on by putting it in the right spot. If you are keeping it outside it has to be in a shady area, and if you are keeping it in a shed you may need to take it out of the shed in warmer weather so the temperature doesn't rise too much and harm your worms.

When in the right position and the temperature stays within the worm's tolerance levels they will happily chow down on the food you provide them and get to work multiplying and producing worm castings.

The Best Bedding for Your Worms

When we refer to bedding for worms we are talking about an absorbent material that is high in carbon which is used to create the structure of their habitat. It helps to balance out the low carbon kitchen scraps you are feeding your worms and absorb some of the moisture from them. Over time the bedding will be turned into castings by the worms, though typically at a slower rate than their actual food.

Having the right bedding material is very important because it will keep your worms healthy and help ensure the whole vermiculture system works efficiently. The best types of beddings absorbs moisture and holds it whilst aerating the worm bin, letting oxygen get in to the food to help break it down.

Most people will use a combination if different types of bedding as this will let you take advantage of the strengths of the different materials which balancing out some of their weaknesses.

One of the most commonly used beddings is either shredded cardboard or newspaper. This is great being easy to get hold of and creates a good structure for the worms but it doesn't hold moisture particularly well. However, add some coco fiber (coir), peat moss or some animal manure and they will absorb moisture really well as well as having a very large surface area (as they are made up of small particles).

There are some bedding materials which are just great by themselves such as shredded cardboard or paper, though nothing that is bleached. Peat moss, well-rotted manure, aged compost or coir are also a great bedding materials.

However, by combining another material with this main bedding you can enhance the qualities of it and make it even better for your worms. These are usually added in smaller quantities but include fallen leaves, straw, hay or wood by-products such as sawdust, wood chips or bark, though avoid anything that has been treated with chemicals or comes from conifers as your worms won't appreciate that.

These bedding materials are more about structure than food and will take much longer to break down. However, they will break down and provide valuable nutrition for your worms and help the castings be extremely good for your plants.

One of the best beddings is aged manure which has straw or wood shavings already in it. This gives you the best of both worlds and will help your worms to produce superb quality compost. This mixture will hold water well and offer great nutrition for your worms which will work its way into the castings.

Whilst you can overfeed your worms you cannot give them too much bedding. It is important that your worms have enough room to wiggle around and hide from the light. Remember these worms live in the top few inches of soil and you are trying to simulate this environment in your worm bin.

There is always more food that bedding in the worm bin and over time as the worms consume the bedding you will need to replace it with fresh bedding. You want to add six to eight inches of bedding so there is plenty of room for your worms and then you add the food. Typically you will put the food just underneath the top layer of bedding so that the worms do not need to come to the surface to get the food.

If you do not replenish the bedding then you can find you end up with problems

with the worms in that they start dying and disappearing. You need to remember that dead worms will break down in the worm bin and so will be hard to spot. The fresh bedding helps to aerate your compost bin so that the worms can breathe and without it they can end up suffocating.

Most worm farmers will add some fresh bedding every time they add some food, which is a very good idea if the food waste is wet. Dig out a small depression in the bedding, add some fresh, dry bedding, then the food and cover it with more fresh bedding. This way the worms can get to the food easily enough and the fresh bedding will absorb the moisture and stop the environment getting too damp.

Another approach that some worm farmers find works well is to keep a thick layer of bedding on top of the main composting area. This will grow damp and be consumed over time and you can top it up. The advantage of this is that it stops the worms roaming too close to the top, particularly as this layer can dry out. This dry layer, which you regularly top up, will help to stop your worm bin from getting too soggy, which will lead to problems.

You will learn over time exactly how much bedding your worm bin needs but you've got some good guidelines to get started. Don't be too cautious in adding bedding as it can help you to avoid many of the potential problems found in worm farming.

The Right Environment for Your Worms to Thrive

In order for your worms to thrive, multiple and produce plenty of castings for compost you need to ensure they are in the right environment. If there is too much variation in the environment or it gets too hot or cold then it can kill your worms and slow down their activity.

This chapter will tell you what you need to keep your worms safe, happy and producing plenty of compost for you.

Bedding

The bedding needs to be suitable for your worms so you will use something like newspaper, coir, wood shavings or even carpet under felt. However, you need to make sure this is safe for your worms and does not contain any toxins. You should not use color magazines or treated wood shavings. If you are using the latter then you can buy hamster or rabbit bedding which will be suitable.

The bedding needs to be damp but not soaking wet. If it is too wet then they will drown and if it is too dry then the worms won't be happy. If when you squeeze the bedding water drips out then it is too moist. Adding a thin layer of either damp compost or well-rotted manure is going to help get the composting process going.

Food

Whilst you can throw your kitchen scraps in to the worm bin as is, it will take them longer to break up the larger pieces. If you break up the scraps into smaller pieces then it will be easier for the worms to digest the food. If you place the

kitchen scraps in a plastic bag in your freezer then that breaks down the cell structure which makes it even easier for your worms to digest the food.

Avoid adding onions, pineapple and citrus fruits as these will make your compost too acidic, though if you have an alkaline soil then you can get your worms to produce an acidic compost to help balance the soil.

Meat and fat should be added sparingly, mainly because they can attract rats which will eat through a plastic worm bin.

By adding agricultural lime or crushed eggshells you can raise the pH of the compost and you can make it more acidic with citrus fruit. This is a great way for you to adjust the pH of your compost for your specific needs, i.e. if you want a more alkaline compost for your plants you add food that is more alkaline.

Worms Breathe Too

Your worm farm should never smell bad; it should always smell slightly earthy and never rank or sour. If it does and the contents of the bin are looking slimy and damp then in all likelihood your worm farm has become anaerobic and there is not enough oxygen getting to the mixture.

In this case you need to ensure there is adequate ventilation for your worms. Check you are not feeding them too much or feeding them greasy and fatty foods like meat and dairy. Check the ventilation holes are not blocked and then plump up the bedding so there is better air circulation, adding fresh bedding if required.

The Correct Temperature

Most worms are fairly tolerant of a wide temperature range but the further away the temperature is from the optimal range, the slower the worms will produce compost and the higher the chance of them dying off. Each species of worm has

its own temperature preferences, which we discussed earlier on in this book.

In general, works will breed at temperatures as low as 54-65F (12-18C) but when the temperature gets to 46F/8C they will stop all activity. As the temperature gets to 80F/25C they will become more active and productive but as the temperature exceeds this so their performance will start to drop off.

The more the temperature fluctuates, the more the worms are going to be affected by it and it will impact compost production. If you set your worm farm up in a garage or shed you will have better control over the temperature which will help the compost output to be more consistent.

Be careful about adding fresh manure as this will give off heat as it rots which could end up harming your worms. If you are going to add manure then let it rot for a week or and get the heat out of its system before you add it to your worm farm.

Keeping Your Worm Population under Control

As your worm farm matures so your worm population is going to grow. Given the right environment your worms will breed and you can find that your worm population starts to get out of control and there are too many worms for the size bin you are using.

If there are too many worms then compost production can suffer simply because there isn't enough room for that size population in the bin; they can't move or breathe no matter how much food you add. Imagine squeezing a dozen people into a small car and think about how conducive that would be to living!

When you get too many worms you need to get the population under control so that your worms can be productive. This means removing a chunk of the population to allow the rest of the worms plenty of space to work.

The excess worms can be released in to the wild, though if you are using non-native or exotic worms this is not a good idea as it could be against the law and damage the environment where you live. If you are using native worms then there is nothing to stop you releasing your excess worms into the wild where they will go do the job worms do quite happily.

Other options are to use the excess worms to start a second worm bin, which will mean more compost for you and that you can dispose of more kitchen waste! If you don't want a second worm bin then you can always give the excess worms away to someone you know who wants to start their own worm bin.

Alternatively you can sell your excess worms either to a worm farmer or as fishing bait. You will need sufficient worms to make it worthwhile otherwise you aren't going to make any money but if you fish yourself then you can grab a handful of fresh worms whenever you go and keep the worm population under control.

You will be regularly checking your worm population when you add food and harvest the castings and when you notice the worm population is too high then you need to cull the population.

Whichever method you choose is up to you, but just make sure you stay on the right side of the law and that you protect the environment where you live. There is an opportunity to sell your excess worms and we will discuss turning your worm farm into a profitable business later on in this book.

Harvesting Your Compost

As the worm castings build up in your bin the bottom castings will cure and be compacted. They will be free of worms and clump together, which makes it very easy to handle. Your worms will migrate out of the castings and into the top layers where the fresh food and bedding is to be found.

If you are using the dual layer bin discussed earlier then harvesting your compost is easy as all you do is remove the bottom bin which should be mostly empty of worms and full of compost. You empty the worms out by adding fresh food and bedding to the top bin and the worms will worm their way in to it. There may be some stragglers but these can either be removed by hand or left in your compost as they are not going to harm your plants if they stay in the compost.

If you are using a single worm bin then you will need to encourage your worms to migrate away from the castings and into a different area of the bin. You can do this by adding fresh bedding and food either to the top or one side and keep adding it to just this one place. The worms will then migrate to this area and you can simply pick up this area and put it in a temporary bin whilst you empty your worm farm out. If your worm bin is longer than around three feet then you can put the fresh food bedding on one side but for smaller bins there will not be enough room for the worms to migrate.

You can carefully empty the contents of your worm farm out on to a tarpaulin and separate the castings into a number of cone shaped piles. The worms will continue to retreat to the bottom of the pile meaning you can remove the top layer easily enough. Keep removing the top layer, waiting ten or fifteen minutes then removing another layer and the worms will keep retreating down to the

bottom of the piles. When you get down to the very bottom of the pile you can put that back into your worm bin to start off the next batch of compost.

Your worm castings are one of the best sources of nutrients for plants that you can get. Whether you use the castings or the tea you will find your plants thrive when they are given this. Try to buy worm castings from a shop and you will realize just how expensive they are!

You will start to see your worm bin filling up with castings after three to six months, depending on how big your worm population is. Depending on your need you can harvest the castings as soon as there is some or you can wait until the bin is full and then harvest it.

The quick way of emptying your worm bin is to pick up the top third of the material, which is likely to be bedding, uneaten food and worms and put it in a new bin. Remove the compost, clean the bin and put the worms and their food/bedding back in the original bin.

You are always going to leave some worms in the compost. Unless you are literally going to go through it by hand and pick out every single worm, some will remain. Don't worry as this is not going to reduce the population significantly as there will only be a small fraction of the population left in the compost.

When you remove the worm castings they will be almost clay like in their appearance and very lumpy. If you put it in a plastic bin out of the sun and rain for up to four months it will break down into a fine grained product which you can then use on your plants. Most people will blend about 20% castings in with other compost or soil to make a highly nutritious potting mix or scatter some of it around the base of plants for them to absorb it.

Making Worm Compost Tea

Compost tea is an incredible valuable liquid fertilizer that you can produce from your worm bins. It is a very direct way of improving the fertility of your plants and is the secret of many prize winning vegetable growers.

There are two different ways of getting worm compost tea, you can either siphon off the liquid that is naturally produced, which will be easy if you have built the worm bin as discussed earlier on in this book.

The leachate that drains naturally out of the worm farm is a great liquid manure, though remember to dilute it before you use it.

The other way to produce worm tea is to take the castings and mix them with water, which will produce a compost tea. You can separate out the sludge from the liquid if you want, but unless you are concerned about the amount of solid material you are adding to pot plants it isn't worth your while separating it out.

The real benefit of worm tea comes from the fact that it is full of beneficial bacteria which are excellent for your soil. This helps to fix nitrogen in to the soil, which will benefit your plants. The actual tea itself is full of valuable micro-nutrients and trace elements that are important for the overall health of your plants.

Nitrogen is very important for your plants and is arguably the most important element for them. There is plenty of nitrogen in the atmosphere but it is in an inert form and does not particularly react with any other elements to create compounds. Plants such as legumes are able to fix nitrogen in to the soil but most other plants cannot do this. The bacteria found in worm's guts, which is

transferred into the castings, does have the ability when combined with water to create ammonium ions, NH4 around the roots of the plants. These ammonium ions are very reactive and will form both nitrates and nitrites, which your plants will appreciate as well as combine with elements such as hydrogen, carbon and oxygen to create more complex organic compounds including enzymes, proteins and amino acids. These are essential for your plants and will help your plants grow and be very productive for you.

There is an ongoing debate between worm farmers as to which method of obtaining worm tea is best. To be fair, both work though with the leachate you can find that the amount of bacteria will vary significantly, depending on how fresh it is. The second method will produce a more consistent quality.

The problem with the leachate is that as the liquid sits in the bottom of your worm bin it is going to lose bacteria over time as well as oxygen. As the stagnant liquid loses oxygen so the beneficial bacteria will die off. If you collect the liquid daily and use it then this isn't going to be so much of a problem, but the longer you leave it then the less bacteria will be present.

When you mix the worm castings directly with water the bacteria does not die from a lack of oxygen and remains in the mix where it benefits the soil.

Bacteria, as you know multiplies rapidly and when it is in the right environment it will multiple very quickly indeed. In the leachate it just isn't in the right environment and so it will die off because it does not have access to the resources required to breed.

You can help the bacteria along by oxygenating the liquid with an air stone and pump, similar to that used in fish tanks. They are cheap, easy to get hold of and will help the bacteria multiply. If you can add some food such as whey,

molasses or another high energy food then your bacteria will go wild and multiply like crazy. Just remember you cannot store the worm tea as the bacteria will die over time and it will no longer be as effective.

The best way to use both products from your worm farm for use as a liquid fertilizer, is to use the collected leachate liquid from the bottom of your worm bins, together with some added water, to wash out some freshly harvested worm manure – instead of just using water alone. Then aerate the entire mix for 24 hours together with some molasses. After oxygenating the mix, use it on the soil immediately, don't give the bacteria time to die off.

The worm tea and compost is a fantastic organic product which is great for your plants. To produce larger quantities of worm tea you can steep cow manure together with worm compost in water to create a very valuable liquid fertilizer.

A quick recipe is to mix three parts cow manure with one part of your worm compost, diluting it in twelve parts of water or the leachate from the worm bins. Aerate this with an air stone from a fish tank. The manure will be rapidly broken down and you will get a great liquid fertilizer plus the solid matter can be used as a mulch.

When making a compost tea using water do not use water direct from the faucet as it contains chlorine which will kill off the bacteria you are after. Instead use rain water or water from a river or pond. If this is not possible then fill a bucket with water from your faucet and leave it open for a day or two and the chlorine will evaporate off so the water is safe to use.

If the weather is too cold then the worm tea becomes harder to make because the

microbes slowdown in the cold. However, most people are not fertilizing their garden in the colder months so this is not necessarily a problem. However, if you are making a compost tea in the winter then store it somewhere like a shed or garage where it is not going to get too cold.

Before adding compost tea to the soil you are best to loosen the soil a little with a garden fork. This will prevent the water running off and missing the plant you are trying to fertilizer. It will also help the soil absorb the bacteria and water so it goes straight to work. Any stray worms or eggs will also be better absorbed into the soil so they can get to work. The solid matter in the bottom of the liquid can be poured on the soil and lightly forked in to provide additional nutrition for your plants.

This liquid fertilizer is fantastic for your plants and will help you produce healthy and happy plants. Packed full of micronutrients and beneficial bacteria it is definitely one of the best foods you can give your plants and there is nothing quite like it in the stores!

Propagating Your Worms

When you first buy your worms you are likely to buy enough to get you started rather than enough to fill your bin. Your worms are going to quite naturally reproduce when you have them in an environment they find comfortable, i.e. they have enough food, it isn't too wet and it is dark enough. Over time your worm population is going to increase and you are obviously going to have to empty out the excess worms, use them to start further worm farms or use them as fishing bait. You can make some good money selling your excess worms and some people will make worm farming into a business, more on that later on.

All earthworms are hermaphrodites, meaning they have both male and female sex organs so when you pick up a worm it isn't a boy worm or a girl worm, it's a bit of both! During mating both of the worms produce sperm which fertilize eggs in both of the worms. Knowing this helps you to understand why your worms multiple so quickly.

How long it takes the worms to reach sexual maturity depends on the species. Eisenia Fetidae, for example will take between eight and ten weeks, as will most composting worms. As they approach maturity the colored band around the worm develops and becomes increasingly prominent. Usually this bulge is light pink in color though it can be yellowish in some worms.

When the worms start to mate they twine around each other and look like they have tied themselves into a knot. During mating you want to leave the worms to it and disturb them as little as possible, though you may find that there are some worms mating no matter when you harvest the compost.

Whilst you don't need to know the ins and outs of a worms sex life, you do need

to know that the worms will produce eggs which look like small balls. There will usually be a larger, hard cocoon which encloses the gel like eggs. These cocoons are about the size of a grab pip and are shaped like birds eggs. You will see them when you are harvest your castings and clearing out the worm in. Don't throw them away and try to save what you can as they will grow into new worms. Remember that your worms will age and die so you need this reproductive cycle to keep your compost bin productive.

Once the eggs hatch the worms leave these cocoons and typically anywhere between seven and fifteen worms will come out of each cocoon. It typically takes around seven weeks for the eggs to hatch.

You will see baby worms in your worm farm which is great news. If the worms are multiplying then they are happy in the environment that you have given them. If your worms stop reproducing then that means there is something wrong in your worm bin and you need to work out what it is and resolve the issue.

Pests, Enemies and Potential Problems

In most cases your worm farm is going to be completely trouble free and the worms are going to happily produce compost, providing you give them the best environment with the right food, bedding and conditions. However, occasionally problems can happen and you can find pests harming your worms or other issues which are affecting the output of your worm farm.

Prevention Beats a Cure

The best way to deal with any pests in a worm farm is to make sure they cannot get established. In order to do this you need to ensure that your worm farm is well maintained. This includes:

- Ensure the bin lid fits securely and there is no way in for pests, i.e. all gaps (not the ventilation holes) are plugged
- The worm food is covered with a layer of bedding to stop them rotting and attracting pests
- Greasy food, meat and dog / cat waste are not added as they will attract flies, maggots or even rodents which will eat their way through your bins
- Your worm farm is sited properly – in a shed or garage will help keep pests away providing the windows / doors are screen if required
- If flies are a problem in your area then drape some mosquito netting over the bins to stop the flies getting in

Potential Pests

There are a lot of potential pests that could be a problem for your worms. Which

ones you encounter will depend on where you are in the world and where you have sited your worm farm. These include:

- Rats and other rodents
- Moles
- Raccoons
- Ants
- Slugs / snails
- Mites
- Reptiles
- Gophers
- Amphibians
- Some beetle larvae
- Other insects

Luckily if you have built your bin properly and are managing the worm farm correctly most of these are never going to be a problem for you. However, just in case you do encounter one of these pests, let's talk a little bit about the pests and how to tackle them.

Ants

Ants can be incredibly destructive to your worm farm and can wreck them in just a few days so if you spot ants you have to deal with them straight away. Ants will be attracted to the food scraps you are feeding your worms so make sure that you do not drop any food when feeding your worms and clear up any spillages straight away.

If ants are a problem then you can keep them away by putting the legs of the bin in dishes of water or using some ant goo on the legs.

If the ants have already invaded the worm farm then you need to use ant traps or ant powder on the ground around the worm bin being careful not to get any on the worm farm itself. Look for the ant trails and douse those areas too.

Should the ants already made their home in your worm farm you can soak the area they are living in with water and they will go away. Afterwards it is worth changing the bedding in your worm farm so your worms aren't living in a wet environment.

Mites

These aren't going to harm your worms but they do look untidy and they are going to compete with your worms for the food, which can mean your worms don't get enough to eat.

In most worm bins you will have some mites already living in the bin, most often the earthworm mite but unless their population grows out of control they aren't really a problem. If you aren't managing the bed properly then you can find a population explosion of mites. An earthworm mite is small and usually a brown to red color, loving around the edges and near the surface of your worm bed. They won't attack your worms but they will eat their food. If the mite population grows too big then the worms will not come up to the surface to get food, instead burrowing deep in the worm bin away from the mites.

A large mite population can be caused by a number of different things including:

- Over-feeding – if your worms have too much food then it starts to rot, which will encourage the mites to multiply
- Meat or overly wet food – if the food you are feeding your worms is too damp then it can cause the mite population to explode so add a layer of bedding above the food to help dry it

- Too much water – the worm beds need to be damp but not wet. Too little drainage will cause the mites to take over so make sure you have drilled sufficient drainage holes in your worm bins

The best way to keep the worm population under control is to give your worms an ideal living environment, which is not ideal for the mites. If you happen to find mites taking over the worm beds then give the beds a few hours of sunlight, which won't harm the worms as they will disappear to the bottom of the bed. Then reduce the water and food. Whist mites are generally harmless they will cause your worms to slow down producing the castings you are after.

Fruit Flies

These pests are attracted to overripe fruit and will lay their eggs in the rotting fruit. They aren't a serious problem, more an irritation than anything else, but just make sure that if you add fruit it is covered with some bedding. A simple resolution is to half fill a used jam jar, still with some sticky jam in it, and leave it next to the worm bin. Whilst you can use commercial insecticides these are dangerous to you, your worms and the environment. These pests are going to annoy and look untidy but they are not going to cause too much harm to your worms.

Blow / House Flies

If you find larger flies buzzing around your worm farm then this is usually because you have added pet waste, greasy food or meat to the bin. These flies are not desirable as they spread disease, are unsightly and frankly downright annoying. If your worm bins are not properly sealed then you can also have a fly problem. As your bin will be under shade you can hang up some fly strips, which will help to keep them under control. However, if you are maintaining your worm bin properly these shouldn't be a problem for you.

Black Soldier Flies

These are unsightly but are not a serious threat to your worms as they do not cause any harm to them. In fact, these flies do not even compete with the worms for food and actually compliment their activities. You may not want to actively attract these flies to your bin but their waste product is a great compost and their maggots, dried or live, are a high protein poultry or fish food and can be turned into a processed meal. They also make a good fish bait. The easiest way to avoid these is to not add meat or fatty waste to your worm bin and cover the food with dry bedding to keep moisture levels under control.

Unlike house flies the black soldier fly does not spread disease and, like your worms, actually digests pathogens and renders them harmless. The odor given off by these flies also discourage house flies and a few other pests. These flies do not bite or sting and some worm farmers consider them a benefit to their worm farm.

Black Soldier flies are gaining a lot of attention though because they are being investigated as an alternative for worms and also for the processing of sewage or other agricultural waste. Initial experiments show that a colony of Black Soldier flies can break down waste material far quicker than a worm farm of the same size.

Springtails

These are oblong shaped, wingless insects which usually live in decaying plant matter. They jump when disturbed, making it easy to recognize them and in large enough numbers they can turn the surface of your worm bed. They will eat worms that are dead or weak but are more often a pest because they eat the worm's food and will drive your worms deep into the beds stopping them from feeding. Follow the approach for dealing with mites to deal with springtails.

Creating a Worm Farming Business

Worm farming can be done at home for fun and to create your own compost either to help you win competitions or just grow stronger plants. For some people though they turn it into a business which can make a bit of extra cash or even a full time income when expanded enough.

Worm castings are not cheap to buy. A single pound of castings will cost you about $6 though in larger quantities it is cheaper with it selling online for around $20 for fifteen pounds of compost.

The castings though are not the only profitable part of worm farming as you can sell the worms themselves, either as bait or to other worm farmers. Going online you can sell 250 worms for around $11 and 1000 worms sells for around $25. These can be used by worm farming but there will also be local fishing stores that stock live bait who may also buy the worms from you to sell on to their customers.

There are quite a few possibilities and this chapter will give you an idea of the potential of worm farming as a business for those readers who want to take their hobby a step further and start making money from it.

Steps to Worm Farming Profits

As with any business, you need to commit yourself to the business and follow a number of steps which will help you to be successful with your worm farming business.

Step 1

You need to create a business plan for your worm farm determining how you are

going to create a profit from farming worms. Look into the industry and determine possible outlets for your worms, both online and locally, and determine how profitable your business can be. Create some financial projections to help you determine the level of income you can achieve and to work out your costs, expenses and profit margin. Remember to take into account costs of postage and packaging if you are selling online.

Step 2

It is important to set up the legal aspects of your business from day one so that you do not end up getting into any trouble with the tax offices. Decide if you are setting up a company, working as a sole trader and so on. If you need to buy a business license then do so and register your business with the appropriate authorities. It is better to do this right at the start than try to catch up later on when you have the tax man breathing down your neck.

Step 3

With any business you need the correct insurances. If you are operating out of your home then you may need to change your home insurance policy to cover your business. If you are hiring people then you need the appropriate insurances for them and it is worth insuring your worm farm as well so that you can limit your financial risk.

Step 4

Buy the equipment that you need. This can be new, used or reclaimed. You will need bins for your worms, racks for the bins and so on. Get together everything you need to start worm farming and find a suitable location to create your worm farm, either at your home or business premises. The location needs to be cool and dark so that your worms are protected from extremes of temperature and direct sunlight.

Step 5

Buy your starter worm population. This is going to be cheapest if you can get them from another worm farmer locally though you can buy them online from a wide variety of retailers. Remember that your worm population will grow over time and that you don't want to start at maximum population.

Step 6

Start feeding and looking after your worms, concentrating on getting the population to grow. Once you have got lots of worms there is very little more you need to buy. Use food waste from your kitchen, friends, family members and even contact local businesses and restaurants if you are farming on a large scale to obtain their food waste.

Step 7

Advertise your worm business and sell your castings or worms, whether this is locally, online or in speciality publications. This is where you find a market for your worms and sell them, creating the profit you are after.

Because you are worm farming for profit it is absolutely vital that you take proper care of your worms. If you set your worm bins up properly, secure them against pests, feed them properly and keep the right balance of moisture and bedding then your worms are going to stay healthy, thrive, reproduce and create plenty of worm castings. Without proper care your worms are going to struggle to work for you and you will find it hard to turn a profit.

Worm Farming – A Profitable Business

Raising earthworms, surprisingly enough, is a very profitable business once you know enough about looking after your worms and scale the operation up to a suitable level.

The two main types of worm used in commercial operations are the Night Crawlers and Red Worms. The latter are most often used in smaller operations and by home worm farmers and the latter is the worm of choice for commercial farmers. There are plenty of other varieties of worm, many of which we discussed earlier on so make sure you pick the right type of worm for your location and plans, making sure you know how to look after that type of worm.

The advantage of Eudrillus Eugeniae (African Night Crawler) is that they grow between 6 and 8 inches long, making them superb for bait! You get around 150 of these worms to the pound and a 3½ gallon bucket will typically contain about 300 of these worms. These are very voracious worms that produce large amounts of castings very quickly.

Harvesting the worms and the castings can be a laborious job so it is worth spending $10 to $20 buying a worm sifter. This will sift out the castings and the worms very quickly without having to do it by hand. For your business this is a vital investment as it is going to save you a huge amount of time and is worth buying.

The European Night Crawler is also another great worm to use commercially as they too are large, fast composters, prolific (extremely so), great bait and a very durable worm. These worms can get as fat as your little finger and are great for anyone who fishes for trout, bass or catfish. These are well worth looking into as potential worms in your worm farm and will mix well with other types of worm.

Which Worm Farming System?

In the smaller commercial worm farm you are going to use bins or beds, particularly when you get started and before you scale up your operation. You can make your own bins or buy some premade ones that look like this:

These are great because they save a lot of time building bins, look good and are very easy to get set up and maintain. Whilst they will cost you $140+ per bin you can easily have a very neat and easy to maintain worm farm that does not require any repair work for some time. They are also very easy to expand as all you do is buy more bins. The leachate is easy to drain off and you can rotate the bins, as discussed earlier in the book.

Harvesting the End Product

This is a very important decision that you must make as it will directly impact how much time it takes you to harvest both the worms and the castings. The three parts of worm farm you can sell are

1) Castings
2) Eggs (cocoons)
3) Worms

Separating these and collecting these is going to be hard word and very time consuming so you want to do it as easily as possible. A worm sifter is a must have investment because it will save you a lot of time. Whilst you can buy cheap ones for $10 to $20 depending on the size of your operation you may need a much bigger one. These are going to cost more but they will allow you to process larger amounts of worms and save significant time.

Marketing Your Products

There are a number of different markets that you can sell the products of your worm farm to. Your worm castings are a valuable organic fertilizer with a big market in home growers. The cocoons are sold for composting and gardening

and the worms themselves are sold to composters and anglers.

In order for you to create a good income you need to have a good market. For example, if you live in an area where it is legal to cultivate marijuana then worm castings is a very valuable resource for these growers.

Start your business small and then as it becomes more and more successful so you can build up with more bins, more worms and produce larger amounts of sellable products. When you start off you are likely to do most of the jobs by hand which means you know exactly what needs doing and as the business becomes profitable so you can buy more equipment and expand.

Anyone can start their own worm farming business at home and with the power of the Internet it isn't hard to sell your worms and compost. There are plenty of outlets for it with anyone able to sell through sites such as Gumtree, eBay and Amazon. Finding local markets is even better because you do not have to mail your produce which can be a hassle plus you have the extra cost of packaging.

If you are enjoying worm farming then this could be a great way for you to make a little bit of extra money and if you expand your worm farming operation as your worms reproduce then you can very quickly have several productive bins going. Not everyone wants to turn their hobby into a business, but for those that do this chapter will have helped you get started and given you plenty to think about.

Worm Farming Tips and Advice

Keeping worms isn't difficult and if you look after the worms then they are mostly problem free. Maintaining ideal conditions is not actually that difficult and this chapter will give you some simple to follow rules and advice to run a successful worm farm.

Layer Food 1" At a Time

Do not overfeed your bin as it encourages problems and attracts pests. Spread the food evenly over the top of your bin to a depth of no more than 1" (2½cm) per day. Cover the food with a layer of bedding to absorb excess moisture.

Uneaten Food Maximum Depth 2"

Don't let the uneaten food build up in your worm bins. If uneaten food builds up it will rot which means the worms won't eat it and it will attract pests. If you see too much food in you bins then stop adding food for a couple of days to allow the worms to eat up. If the food starts to rot then remove it from the worm bin and replace it with fresh food.

Balance the Acidity

Occasionally adding fibrous material such as shredded paper, dead leaves, cardboard or sawdust will help balance the acidity of your bin so that the resulting compost has a fairly even pH level. You can also add some wood ash or lime which will also help. This will help to stop the bin from smelling bad.

Avoid Lots of Processed or Acidic Food

Processed foods such as bread and pasta can become acidic when it decomposes. Acidic foods such as onions, citrus fruit and fruit skins can also tip the balance towards acidity.

Harvest When the Bin is Full

Do not remove the castings until the bin is full otherwise you are going to disturb your worms which is going to stop them from producing compost for a little while.

Signs of a Healthy Bin

When your worm farm is operating properly you will notice the following:

- Little, if any, smell
- Lots of worms, including babies, in the top couple of inches of your bin
- Very little uneaten food deeper down
- Good quality worm castings
- The leachate is the color of a strong tea and has very little smell

If your worm farm does not adhere to any of these points then you need to check it carefully as there is something wrong that needs to be addressed before it impacts and harms your worm population.

What to Do If Your Worm Bin Smells

Okay, you've been looking after your worms, feeding them but the bin is starting to smell. When you check the bins out you may well notice that the food is rotting before your worms can eat it.

This typically means you are adding too much food for your worm population so you need to reduce how much you are adding until your worm numbers increase. Add a layer of bedding each time you add food which will help to balance the acidity in the bin and stop it from becoming too moist. You can even sprinkle some soil or potting compost into your worm bin to help balance it

out.

To produce the best quality compost you need to ensure that you have the right carbon / nitrogen ratio which is 20:1 in a worm farm though your kitchen waste is likely to have a ratio closer to 12:1. Balancing the ratio by adding fibrous material, as discussed before will help to balance this out. If you are going to add grass clippings then make sure they are brown rather than green.

If your bin has become too acidic then you can find it smells. Sprinkling some dolomite lime over the top of your bin will help reduce the acidity, but this can be offset by adding a layer of bedding each time you add food.

Do I Water My Worm Farm?

In general the answer is no, though on occasion you may want to sprinkle it with water. When you have changed the bin you will need to damp the bedding but after that the moisture will come from the kitchen scraps you are providing. Excess liquid will drain out of the bottom of the bin but if it is hot and the contents of the bin are drying out then you will need to add some water, though be careful you don't add too much or you will drown the worms. As a rule of thumb the top of the bin should be as damp as a wrung out sponge.

How Much Liquid Does A Worm Farm Produce?

This will depend on the size of the worm farm but a typical home worm farm can produce as much as a pint of liquid a day when it is fully populated. Remember that this liquid must be free to drain out otherwise it will flood the bin and drown the worms. Regularly check that the drainage holes are free of obstruction and the liquid can flow out of the bin.

If you are not getting a lot of liquid then it could be that it is evaporating before it drains out which means that your worm bin is too hot and needs to be moved

somewhere shady.

When you have set up a new worm bin it can take a few days before it starts to produce leachate. The same will happen when you harvest the castings and change the bedding. It takes a few days for the compost to become properly saturated though you can help it along by sprinkling some water on the new bedding to help dampen it out.

The Worms Look Like They Are Trying To Escape

If you see the worms clustering together at the top of the bin then they are trying to stop themselves from drowning. It is a natural response and the reason why worms come to the surface when it rains.

This means that the conditions in the bin are not favorable for your worms and that you need to dry out the compost bin immediately. Add some more bedding and remove any lumps of wet food. It could be that you are overfeeding the worms so check the amount of uneaten food too.

Check that the bin is not getting flooded by water dripping into it or from rain. Typically though if your worms are clustering at the top you need to dry out the bin and adjust the food levels.

What to Do If You Go On Vacation

If you are going on vacation then you are going to need to get someone to look after your worms. Because the fresh food will rot you cannot fill the bin with a week or two's worth of food as it will just rot and harm your warms.

What you can do is add some damp shredded paper, some brown lawn clippings or some dead leaves to the food for a week or two before you go. Make sure this is all damp so it doesn't dry out whilst you are away. With this drier food you

can typically leave a worm bin for two or even three weeks.

If you are going away for longer than a couple of weeks then you can alternate layers of shredded paper, leaves or brown grass clippings with layer of food scraps. About 12” of food will last for six to eight weeks. Ensure the dry layers are damp so that they do not dry out whilst you are away.

However, if you can get someone to check in on your worm farm then that is better for you and for the worms.

Disaster Management

No matter how hard you try with your worm bin there will always be times when disaster strikes and whilst the last chapter was designed to give you advice on how to manage your worm bin and deal with the common problems, this chapter is designed to help you manage the major disasters. In most cases you are not going to encounter any of these problems, but just in case you do here are some of the common disasters and how to overcome them.

The Bin Smells and There Are No Live Worms

If there is too much rotting food in your worm bin then it will become an anaerobic environment, meaning it is low in oxygen. Unfortunately these conditions are not good for your worms and they will die in an oxygen poor environment. If this is the case then you need to empty your bin, saving any live worms you find, clean the bin thoroughly and then add fresh bedding and food, covering the food with a layer of bedding before reintroducing your worms. You may be able to find some castings that you can use though they can be affected if the environment is too wet.

If there are very few worms left alive then you are going to have to buy some more worms and let them reproduce.

I've Removed the Bottom of The Bin and the Contents Have Fallen Out

Ideally your worm bin needs to be tapered towards the bottom. This compresses the castings as they move down in the bin and, in an ideal world, only the bottom castings fall out when you remove the base of the bin. The rest will be held in place by the shape of your worm bin. If the contents fall out (assuming you are harvesting this way) then you have removed the bottom (found in many pre-made store bought systems) before the castings have been suitably compressed.

If you have lost all of the contents then put them back in the bin in the same order they came out, as best you can, keeping the castings and oldest material at the bottom. The worms should start again and you can then empty the bin when it is full.

If just some of the contents as fallen out you can put the bottom back in place and put the castings at the top of the bin. Give it a week or so for the worms to adjust before you resume feeding your worms their full amount.

However, if you have used plastic boxes and made your own worm bin then this isn't going to be a problem because you will not remove the bottom but will harvest in a different way.

The Bin Has Been Knocked Over and Everything Has Spilled Out

This happens unfortunately, particularly where kids, dogs or just clumsy adults are involved. We've all done it at some point and I know I am particularly liable to dropping worm bins when I am rotating them.

If this happens then turn the bin back up the right way and make sure it is securely in place. Put whatever has come out back in the same order, as best you can, with the castings at the bottom and the food/live worms at the top. Leave it for a days so the worms can get used to their environment again and then start feeding them again. Keep an eye on whether the food is being eaten or not as it can take several days for the worms to migrate back up to the surface.

Worm Farming Glossary

When it comes to worm farming there are a lot of terms used which may be unfamiliar to the newcomer to the hobby. I have used many of the terms in this book and tried to explain them as and when we used them. This chapter will define the jargon used in worm farming so you have a clear understanding of what the words mean so there is no chance of any confusion.

Acidity – This is how acidic the soil is which is measured on the pH scale. The optimal level of acidic is what is known as neutral or a pH of 7. Typically you will vary a bit on either side of this but over time you will find the worm bins become more acidic, particularly if it is too wet. Feeding your worms too much acidic fruit or pine needles will increase the acidity levels of your worm bin. Balance the acidity by adding more bedding, reducing the moisture levels, reducing the amount of acidic and processed food or by adding a sprinkling of agricultural lime.

African Nightcrawlers – Eudrilus Eugeniae are large worms, usually over six inches in length and are great for composting and fishing. They will tolerate temperatures from 45F to 90F though are happiest at 75F to 85F. They do not like the cold, being handled or being disturbed. Typically you will get around 200 worms to the pound.

Anecic Worms – These are worms that live deep underground and so are not suitable for vermiculture. They are great in your garden but live too deep to break down food scraps to produce compost.

Bedding – This is the habitat for your worms and can be made up of a variety of different substances including coconut coir, shredded newspaper or cardboard,

partly rotted compost or any other fibrous organic material. You typically dampen it before you put it in the worm bins so that it is not too dry. When you feed your worms you put a layer of bedding on top of the food to absorb excess moisture.

Bins – The containers your worm farm are constructed from, made up from a non-toxic material, typically plastic though you can use timber or other materials. Usually your worm farm will consist of two or more bins though you can make them from a single bin. You can buy pre-made bins or make your own. There will usually be a tap or other way of collecting the leachate and it will be supported off of the ground. Your worm bins should always be opaque (black or dark green is best) as your worms do not like light.

Black Soldier Fly – Hermetia Illucens is a tropical fly originally found in the Americas though now found all over the world. The larvae are small maggots that feed on rotting material and are often found in worm farms though are no threat to the worms, actually complimenting their activity. These flies will produce a good quality compost, do not spread disease and their maggots are a great fish or poultry feed. Some people use these instead of worms to create high quality compost.

Citellum Band – The light colored band found about half an inch behind the head of a sexually mature worm. It is from this that the cocoons (egg casings) form as rings before they slip off the worm's body.

Cocoons – When the worms mature sexually, at about eight to ten weeks after hatching, you will start to find these in the worm bedding. The cocoons are about the size of grape pips and vary from a pale yellow / brown to grey initially, darkening to a more mahogany color as they get ready to hatch at around seven weeks.

Detritivorous – A term used to describe something that lives on waste material, e.g. composting worms and black soldier flies.

Eisenia Andreia – Known as tiger worms for their alternate bands of light and dark red, often confused with Eisenia Fetida (Foetida), both of which are known as red worms. They breed rapidly and are very productive in a worm farm, also making great worms for fishing. They grow between two and three inches in length and you will get around 1000 worms per pound. They are found all over the world and so are not an invasive species. They will tolerate temperatures from 38F to 88F though prefer 70F to 80F.

Eisenia Fetida (Foetida) – Known as red wigglers, amongst other names, they are great fishing worms as they are active on the hook and stay alive in water for a while. They grow to between two and three inches in length and you will get around 1000 worms to the pound. They breed rapidly and are an excellent worm for vermiculture. They like the same conditions as the previous worm and are found all over the world.

Eisenia Hortensis – The European Nightcrawler is also known as the redworm and will grow up to seven inches in length, though more often are between three and four inches long. They breed rapidly and produce lots of castings, making them superb for vermiculture. They are very sought after as fishing bait because they are suitable for salt water fishing and can tolerate water close to freezing. In a pound you will get between 300 and 400 worms.

Endogeic Worms – These are worms that live in the upper layers of soil and are geophages, meaning they feed on soil with lots of organic matter such as that found around grass roots. In nature they bring nutrients to the roots of plants, improve aeration with their burrows and helps increase moisture retention by the

soil.

Epigeic Worms – These are the surface dwelling worms, of which compost worms are a type. These are the detritivourous worms which process waste matter and turn it into compost. They are not particularly good diggers and so need plenty of organic matter, hence why they are used in vermiculture. They need good soil aeration and live in fallen plant material rather than soil.

Endrilus Eugeniae – Known as African Nightcrawlers these will grow over six inches long easily. They are great for vermiculture as well as for fishing as they have a firm skin and are very lively on the hook. They will tolerate temperatures from 45F to 90F though prefer 75F to 85F. They do not like extreme cold and dislike their environment being disturbed. Due to their size you will get around 200 worms to the pound.

European Nightcrawler – Eisenia Hortensis, also known as the Carolina Crawler and Belgian worm. It is great for composting and fishing, being able to tolerate very cold water and being suitable for salt water fishing. It is a fast breeder and will grow up to seven inches in length though is more commonly three to four. Typically you will get anywhere from 300 to 400 worms to a pound.

Fishing Bait – Earthworms are commonly used as fishing bait but not all worms are suitable. Red wigglers are often used though they are small but active on the hook. The larger worms tend to be better suited for bait as discussed earlier in this section.

Geophage – Creatures that consume humus soil, which has some organic content, such as termites, earthworms and other similar small creatures

Hermaphrodite – Having genitalia of both the male and female. Worms are hermaphrodites and can produce eggs from a single sexual encounter.

Indian Blue Worm – Perionyx Excavatus is a species of worm with an iridescent blue sheen on its skin. It is from a tropical climate and so does not like the cold nor does it appreciate handling or having its home disturbed. It is small in size but is great for vermiculture because it is a prolific breeder and matures rapidly. It is well known for escaping from worm farms and is not very popular because of this. It can be considered an invasive species and you may find some areas do not permit these worms to be owned. These worms will tolerate temperatures from 45F to 90F though do best at 70F to 80F.

Lime – Agricultural lime is used to balance the pH of a worm farm by sprinkling a little over the top of the bed. Avoid using quick lime or calcium hydroxide as both of these will harm your worms as they are very corrosive.

Lumbricus Rubellus – This is a European worm also known as the red wriggler or driftworm and is not an actual composting worm. Whilst it is a burrowing worm it tends to feed up near the surface. It grows up to four inches in length and is very popular in vermiculture. It stops breeding when the temperature hits 40F and is most active at 50F. It is a lively worm on the hook and is also suitable for salt water fishing. However, as a European worm rather than a North American one it is an invasive species and is not killed off by low temperatures in winter, able to overwinter under the ground. It causes damage to native forests and is not allowed in many areas of the USA and Canada. However in Europe it is a popular worm.

Lumbricus Terrestris – The common earthworm which is not suitable for vermiculture as they are anecic in nature, burrowing as far as six feet underground. They are great for gardeners as they aerate the soil, but no use in

your worm bin.

Microbes – Tiny living organisms found in the soil and are a part of nature. Some are pathogenic, meaning we call them germs and others are beneficial and help to break down decomposing waste. Your worms will neutralize pathogens in the material they break down and deposit benefit microbes in their castings which is a part of what makes worm compost so beneficial.

Perionyx Excavatus – The Indian blue worm which has a very distinct iridescent blue sheen to it, which gives it its name. It is small and can be used in vermiculture as it matures quickly and breeds prolifically but it does not tolerate the cold or its environment being disturbed. They are known as good escape artists and tolerate temperatures between 45F and 90F though their optimal temperature is 70F to 80F.

pH Level – A measure of acidity and alkalinity of a substance on a scale of 1 to 14 with 7 being neutral. The lower the number, the higher the acidic and the higher the number the higher the alkalinity. You can buy pH meters to test your worm compost and you are aiming for a pH level of around 7 for ideal conditions, though typically it will vary from around 6.5 to 7.5.

Red Wiggler / Red Worm - The name given to a number of different worms both in the USA and Europe which are used in vermiculture. Due to the possible confusion with the common name most worm farmers will use the Latin names (see above) for the worms to ensure they buy and use the right worms.

Stacked Bin Worm Farm – One of the most popular types of worm farm made from nested, tapered plastic containers. The lowest container has a tap on to drain out the leachate and it will be raised up on legs. The containers have air holes in the sides for ventilation and in the bottom to allow the leachate to drain

out. The whole structure is lidded to keep out pests. Most home worm farms will consist of 2 or 3 bins and you encourage the worms to migrate up a bin when the lower bin is full of compost. The full bin is emptied and placed back on top. You can make your own or buy pre-made systems.

Tiger Worm – Eisenia Andreia – see earlier in the glossary.

Vermi – The Latin word for worm, often applied as a prefix to words to describe worm farming.

Vermicompost – Worm castings or compost which is the by-product of worm farming. It is actually the faecal product of worms but is packed with nutrients and beneficial bacteria that your plants need. A much sought after soil additive that is prized by gardeners across the world.

Vermiculture – The process of farming worms and producing worm compost or even worms for sale or bait.

Vermitea – Another name for worm tea, i.e. the leachate produced through the worm composting process. It is vital that that can drain from your worm farm otherwise you can end up drowning your worms. See the chapter on Worm Tea for more information on this.

Endnote

Worm farming is a fantastic way of making a highly nutritious compost for use in your gardening. Whether you grow for fun or for competitions, you will find this organic, nutritious compost gives your plants a much needed boost and helps them to produce healthy growth and bountiful crops.

Worm farming isn't particularly hard to do, once you have got to grips with the basics and got into a routine. It is also surprisingly problem free providing you maintain your bins properly. In most cases you are only going to have problems if you overfeed your worms, do not feed them properly or do not site your worm farm correctly. For most worm farmers there are going to be very few problems and the worms will happily produce plenty of beneficial compost.

Remember when you start out your worm population is going to be relatively small and it will take a few months for the worms to reproduce and build up to the correct amount for your worm farm. Do not overfeed them at this time and gradually increase the amount of food as the worm population increases; you can tell from how much uneaten food is left whether or not you are feeding your worms too much or too little.

The resulting compost is organic, free from pesticides and other pollutants and is an ideal food for your plants. I can honestly recommend it on your prize crops as a great way of giving them that edge. Even the leachate is valuable and worth using on your plants to give them a boost.

You have now got a good understanding of worm farming and the entire process of raising worms and producing great quality compost. If you now go and buy a couple of plastic bins, a tap for draining the leachate and some worms you will

be ready to get started and build your own worm farm. It doesn't have to take up a lot of space and is a great way of recycling household waste which would otherwise go to landfill. You may even find you enjoy worm farming so much that you decide to turn it into a business, which can be very lucrative indeed.

Enjoy worm farming and the boost your plants get from the resulting compost and if you have enjoyed this book then please leave me a review on Amazon as I always appreciate the feedback to help me improve the books I write. You can also join me in my Facebook group at www.Facebook.com/OwningAnAllotment.

With worm compost, on average, containing five times more nitrogen, seven times more phosphorus and eleven times more potassium than normal soil it is no wonder it is so good for your plants. Include in this the beneficial bacteria and micro-nutrients and you have a wonder compost at hand, and it is all free as you have made it yourself.

Have fun with vermiculture and enjoy using the compost … your plants will really thank you for it!

Other Gardening Books by Jason

Please check out my other gardening books on Amazon, available on Kindle and paperback.

Growing Fruit: The Complete Guide to Growing Fruit At Home

This is a complete guide to growing fruit from apricots to walnuts and everything in between. You will learn how to choose fruit plants, how to grow and care for them, how to store and preserve the fruit and much more. With recipes, advice and tips this is the perfect book for anyone who wants to learn more about growing fruit at home, whether beginner or experienced gardener. Click here now for a preview of the book

Growing Tomatoes: Your Guide To Growing Delicious Tomatoes At Home

This is the definitive guide to growing delicious and fresh tomatoes at home. Teaching you everything from selecting seeds to planting and caring for your tomatoes as well as diagnosing problems this is the ideal book for anyone who wants to grow tomatoes at home. A comprehensive must have guide. Click here now for a preview of this book.

How to Compost – Turn Your Waste into Brown Gold

This is a complete step by step guide to making your own compost at home. Vital to any gardener, this book will explain everything from setting up your compost heap to how to ensure you get fresh compost in just a few weeks. A must have handbook for any gardener who wants their plants to benefit from home-made compost. Click here now to preview this book.

Hydroponics: A Beginners Guide to Growing Food without Soil

Hydroponics is growing plants without soil, which is a fantastic idea for indoor gardens. It is surprisingly easy to set up, once you know what you are doing and is significantly more productive and quicker than growing in soil. This book will tell you everything you need to know to get started growing flowers, vegetables and fruit hydroponically at home. Click here now to preview this book.

Straw Bale Gardening – No Dig, No Bending Productive Vegetable Gardens
This book tells you everything you want to know about the innovative method of straw bale gardening. Discover this no dig, no bend, low maintenance form of growing fruits, vegetables and flowers that is gaining a lot of attention. This book will guide you through the whole process from setting up your bales to planting and more. A complete, step by step guide to this innovating gardening method. Click here now for a preview of this exciting gardening method.

Vertical Gardening: Maximum Productivity, Minimum Space
This is exciting form of gardening allows you to grow large amounts of fruit and vegetables in small areas, maximizing your usage of space. Whether you have a large garden, an allotment or just a small balcony, you will be able to grow more delicious fresh produce. Find out how I grew over 70 strawberry plants in just three feet of ground space and more in this detailed guide. Click here now to find out how you can grow more in less space!